

ADDITIONAL NOTES ON THE ERIOCAULACEAE. LV

Harold N. Moldenke

PAEPALANTHUS PILOSUS (H.B.K.) Kunth

Additional bibliography: Moldenke, *Phytologia* 30: 108 & 122--125. 1975.

Macbride (1936) cites also Lechler s.n. from Puno, Weberbauer 1116 from Amazonas, and Weberbauer 5182, 6826, and s.n. [Monzón] from Huánuco, Peru. Ruhland (1903) cites Hartweg 1145, Humboldt & Bonpland s.n., Lehmann 6666, Linden 751, and Stübel 137 from Colombia and Lechler s.n. from Peru.

Additional citations: COLOMBIA: Antioquia: Barkley & Saldarriaga C. 43018 (Ld); Gallo s.n. [Daniel 2700] (W-1804249). Boyacá: Fassett 25629 (N, N, Ws), 25633 [Herb. U. S. Nat. Arb. 217440] (Be--114055, N, W-2166184, Ws). Cauca: Barclay & Juaibioy 5730 (N), 5847 (N); Cuatrecasas 23654 (F-1360958); Hartweg 1145 (B). Cundinamarca: Apollinaire & Arthur 26 (W-603108); Bonpland s.n. (B); E. L. Core 5 (N); Garcia-Barriga 11658 (W-1952196); M. L. Grant 9525 (W-2166093); Grant & Fosberg 9238 (W-2166074); Humboldt & Bonpland s.n. [Herb. Willdenow 2371] (B-type, Z--isotype); F. W. Pennell 1997 (Er, F--485439); Perez & Garcia O'Char-don 5155 (W--1740869); M. Schneider 599 (S); R. E. Schultes 18788 (Z). Norte de Santander: Garcia Barriga 10301 (W--1798460); Garganta Fábrega 1209 (F--1277108). Putumayo: Cuatrecasas 11866 (N). Santander: Araque Molina & Barkley 18S351 (N); F. A. Barkley 38C164 (Ld); Fassett 25929 [Herb. U. S. Nat. Arb. 217372] (W--2166225, Ws); Killip & Smith 16064 (N, W--1351838). VENEZUELA: Mérida: Ruis-Terán & López-Figueiras 771 (M). PERU: Puno: Lechler 2206 (Br, S). LOCALITY OF COLLECTION UNDETERMINED: Lejeune s.n. [Am. aequin.] (Br). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B, B, B).

PAEPALANTHUS PIRESI Moldenke, *Résumé* 101 & 489, nom. nud. (1959); *Bol. Mus. Para. Emil. Goeldi, n. s., Bot.* 3: 2. 1960.

Synonymy: Paepalanthus piresii Moldenke apud G. Taylor, *Ind. Kew. Suppl.* 13: 98. 1966.

Bibliography: Moldenke, *Résumé* 101 & 489. 1959; Moldenke, *Bol. Mus. Para. Emil. Goeldi, n. s., Bot.* 3: 2. 1960; Hocking, *Excerpt. Bot. A.4:* 284. 1962; Moldenke, *Biol. Abstr.* 37: 2453. 1962; Dau, *Excerpt. Bot. A.7:* 520. 1964; G. Taylor, *Ind. Kew. Suppl.* 13: 98. 1966; Moldenke, *Fifth Summ.* 1: 165 (1971) and 2: 955. 1971.

This species is based on Murça Pires, Black, Wurdack, & Silva 6189 from the Serra do Cachimbo, at an altitude of 425 meters, Pará, Brazil, collected on December 12, 1956, and deposited in the

Britton Herbarium at the New York Botanical Garden.

Citations: BRAZIL: Pará: Murça Pires, Black, Wurdack, & Silva 6189 (N—type).

PAEPALANTHUS PLAGIOSTIGMA Alv. Silv., Fl. Mont. 1: 117—118, pl. 73. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 117—118 & 411, pl. 73. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 14 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 86 & 211. 1949; Moldenke, Résumé 101 & 489. 1959; Moldenke, Fifth Summ. 1: 165 (1971) and 2: 956. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 73. 1928.

This species is based on A. Silveira 834, collected "In campis humidis inter Serrinha et Itacambira", Minas Gerais, Brazil, in July of 1926 and is deposited in the Silveira herbarium. On page 411 of his work (1928) Silveira cites "Serrinha" as the type locality. In his description he states that the leaves are "2-4 cm medio lata", but surely this is a misprint for 2-4 mm. since the leaves are only 3-4 cm. in length! Thus far the species is known, at least to me, only from the original collection.

PAEPALANTHUS PLANIFOLIUS (Bong.) Körn. in Mart., Fl. Bras. 3 (1): 413, pl. 52. 1863.

Synonymy: Eriocaulon planifolium Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 629. 1831. Paepalanthus monticola Mart., Nov. Act. Physico-med. Acad. Caes. Leopold.-Carol. Nat. Cur. 17 (1): 10. 1835. Paepalanthus iridifolius Kunth, Enum. Pl. 3: 502. 1841. Eriocaulon iridifolium D. Dietr., Syn. Pl. 5: 259. 1852. Eriocaulon iridifolium Kunth ex Steud., Syn. Pl. Glum. 2: [Cyp.] 279 & 334. 1855. Eriocaulon monticola Mart. ex Steud., Syn. Pl. Glum. 2: [Cyp.] 278. 1855. Paepalanthus planifolius var. major Körn. in Mart., Fl. Bras. 3 (1): 413—414. 1863. Paepalanthus planifolius var. minor Körn. in Mart., Fl. Bras. 3 (1): 413—414. 1863. Dupatya planifolia (Bong.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Eriocaulon monticulum Steud. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878, in syn. 1893. Paepalanthus monticolus Mart. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 & 879. 1893. Paepalanthus planifolius Körn. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402, in syn. 1894. Dupatya planifolia Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Eriocaulon vaginans Pavon ex Ruhl. in Engl., Pflanzenreich 13 (4-30): 208 & 288, in syn. 1903. Eriocaulon iridifolium Steud. ex Ruhl. in Engl., Pflanzenreich 13 (4-30): 208 & 286, in syn. 1903. Eriocaulon monticola Steud. apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 208, in syn. 1903. Paepalanthus planifolius var. typica Beauverd, Bull. Herb. Boiss., ser. 2,

8: 295. 1908. Paepalanthus monticola var.  $\sigma$  Körn. ex Moldenke, Résumé Suppl. 1: 21, in syn. 1959. Paepalanthus monticola var. Körn. ex Moldenke, Résumé Suppl. 1: 21, in syn. 1959. Paepalanthus planifolius (Bong.) Ruhl. ex Moldenke, Résumé Suppl. 1: 22, in syn. 1959. Paepalanthus planifolium (Bong.) Körn. ex Angely, Fl. Anal. Paran., ed. 1, 200, sphalm. 1965.

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 629. 1831; Bong., Ess. Monog. Erioc. 29. 1831; Mart., Nov. Act. Physico-med. Acad. Caes. Leopold.-Carol. Nat. Cur. 17 (1): 10. 1835; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 502, 508, 575, 576, 613, & 625. 1841; D. Dietr., Syn. Pl. 5: 259, 260, & 267. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 278, 279, & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 281, 393, 413--414, 499, & 507, pl. 52. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 & 879 (1893) and pr. 1, 2: 402. 1894; Malme, Bih. Svensk. Vet. Akad. Handl. 27 (3), no. 11: 30--31. 1901; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Chod. & Hassler, Bull. Herb. Boiss., ser. 2, 3: 1033 & 1034. 1903; Chod. & Hassler, Plant. Hassler. 2: 255 & 256. 1903; Ruhl. in Engl., Pflanzenreich 13 (4-30): 2, 201, 208--211, 286, 288, 290, & 291, fig. 30. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 295 & 297. 1908; Alv. Silv., Fl. Mont. 1: 241 & 411. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40. 1930; Stapf, Ind. Lond. 4: 518. 1930; J. F. Macbr., Field Mus. Publ. Bot. 13 (363): 491 & 493. 1936; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 & 879 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 5, 7, 14, 29, 30, 36--38, 41, 47, 49, & 51--53. 1946; Moldenke, Alph. List Cit. 1: 223 (1946), 2: 612 (1948), 3: 833 & 903 (1949), and 4: 1301. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73, 86, 210, 211, & 214. 1949; Moldenke, Phytologia 3: 142 (1949) and 4: 201. 1953; Mendes Magalhães, Anais V Reun. Anual Soc. Bot. Bras. 236--237, 266--267, & 276--277. 1956; Reitz, Sellowia 7: 124. 1956; Angely, Fl. Paran. 10: 14. 1957; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 84, 99, 101, 117, 220, 281, 289--291, 293, 326, 327, 487, & 489. 1959; Moldenke, Résumé Suppl. 1: 6, 21, 22, & 26. 1959; Reitz, Sellowia 11: 31 & 119. 1959; Soukup, Biota 5: 302. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 & 879 (1960) and pr. 3, 2: 402. 1960; Rennó, Levant. Herb. Inst. Agron. 71. 1960; Angely, Fl. Paran. 16: 66 (1960) and 17: 24. 1961; Reitz, Sellowia 13: 53, 72, & 90. 1961; Moldenke, Résumé Suppl. 3: 34 (1962) and 4: 12. 1962; Angely, Fl. Anal. Paran., ed. 1, 200. 1965; Teague, Anal. Mus. Hist. Nat. Urug., ser. 2, 7 (4): 47. 1965; Moldenke, Résumé Suppl. 13: 3 (1966), 17: 9--11 (1968), and 18: 4 & 13. 1969; Moldenke, Phytologia 18: 277. 1969; Reitz, Sellowia 22: 104. 1970; Moldenke, Fifth Summ. 1: 142, 165, 187, 366, & 484 (1971) and 2: 503, 506, 508, 515, 584, 586, 588, & 956. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1159 & Ind. 12 & 20. 1972; Moldenke, Phytologia 23: 418 (1972), 26: 28, 236, & 460 (1973), 28: 439 (1974), 29: 306 (1974),

and 30: 81 & 112. 1975.

Illustrations: Körn. in Mart., Fl. Bras. 3 (1): pl. 52. 1863; Ruhl. in Engl., Pflanzenreich 13 (4-30): 209, fig. 30. 1903.

This species is apparently based on L. Riedel 395 from Minas Gerais, Brazil, deposited in the Leningrad herbarium. Bongard's "Pl. 58", sometimes cited as illustrating this species, was apparently never published, according to Kunth (1841) and Ruhland (1903). It probably exists only in the library or herbarium at Leningrad.

Paepalanthus planifolius var. major, P. iridifolius, and Eriocaulon iridifolium are all based on a Sellow collection from Serra do Vento -- probably his no. 840 and/or C.264 in the Berlin herbarium. Paepalanthus monticola is based on a Martius collection from "In montibus Provinciae Minarum", very probably the specimen labeled Martius 840 & 1334 from "In montibus altis ad Villa Rica et Tejuco minar. generalium" in the Munich herbarium, which appears also to be the type of P. monticola var.  $\sigma$  Körn.

The Martius (1835) original publication of the accepted name for the taxon here discussed is sometimes cited as "1833", but this was the date of its submission to the Academy as a manuscript. According to the late Dr. John H. Barnhart, unsurpassed as a botanical bibliographer, the work wasn't actually published until 1835. Incidentally, Jackson (1894) accepts P. monticola as the valid name for the species, reducing P. planifolius to its synonymy.

The Chodat & Hassler (1903) reference, cited in the bibliography above, is sometimes erroneously cited as "11: 256".

Recent collectors describe P. planifolius as a tufted herb, 0.2--1 m. tall, rhizomatous, with "a short trunk", a large rosette of leaves, the flower-heads "radiating from the leaves", grayish or white (sometimes turning black in drying), and the individual florets white during anthesis. Fosberg found it to have "a stem some cm. long but mostly down in peat".

Collectors have encountered the plant on campos, wet campos, grassy campos, wet sandy campos, on sandy river margins and steep sandy slopes with sandstone outcrops at the summit, in wet sand, wet soil bordering brooks, swamps, and wet sandy places in disturbed slope forests near outcrops, along creeks, and in "banhado fora da água", at altitudes of 5 to 1870 meters, flowering from February to December, and fruiting in February, August, October, and November. Anderson and his associates found it in sandy meadows in an area of rocky campo and cerrado sloping down to a wet-sand meadow adjacent to gallery forest along a stream, with sandy soil and sandstone outcrops, and in summit vegetation mostly to 1 m. tall or less with a mossy groundcover in organic soil overlying sandy soil on limestone rocks.

Reitz & Klein describe the plant as an "erva, flôr branca" or "flôr cinza". Fosberg found it to be "common in open grassy bogs" in São Paulo. The Eitens found it growing "in open marshy ground with scattered low shrubs and low treeferns, periodically burned" and "in wet open rolling terrain with small groves and individu-

als of shrubs and small trees (the original vegetation of this area was probably continuous subalpine rainforest) in open soaking marsh soil". Silva reports it as "frequent" on wet campos in Minas Gerais, while Imaguire and Dombrowski both refer to it as frequent in Paraná. Vernacular names recorded for the plant are "botão", "capim manso", "capipoatinga", "co quebra coque", "gravatá manso", "quebra coque", "sempreviva do campo", and "semprevivas do campo".

Bongard's original (1831) description of Eriocaulon planifolium is "Acaule; foliis pedunculosis subaequantibus, late linearilanceolatis, acuminatis, glabris, glaucescenti-nitentibus; pedunculis compressis, striatis, glabris; vaginis truncatis. In umbrosis humidiusculis montis Itacolumi. 4. Bracteae capitula involucentes fuscescentes. Proxima E. compresso Lam. et fortasse non diversum." Kunth (1841) adds "Forsan species legitima?" Actually, Paepalanthus planifolius bears not even the slightest resemblance to Eriocaulon compressum Lam., a species of the southeastern United States!

The description of P. monticola, as given by Kunth (1841), is "Acaulis; caespitosus; glaber; foliis lanceolatis, acutis, e rhizomate villosis, quam scapi simplices compressi brevioribus; vaginis truncatis; capitulis numerosis, in apice scaporum capitato-sessilibus; flocculis albo-lanatis; involucri plumbeo-fuscis ... In montibus Provinciae Minas."

Kunth (1841) gives a detailed description of his P. iridifolius, of which the essential characters given are "Acaulis; foliis rigidis, linearisubensiformibus, acutiusculis, glabris; pedunculis folia superantibus, compressis vaginisque glabris; his apice oblique truncatis, imberbibus; capitulis subglobosis, albivillosis, tardius glabrescentibus; bracteis ciliato-hirsutis; sepalis exterioribus glabris (primum hirsutis?); fructiferis induratis; stigmatibus longissimis, apice bifidis. -- Brasilia meridionalis. (Serra do Vento). Sellow legit."

Ruhland (1903) cites for the typical form of P. planifolius Clausen 266, Glaziou 15524, 15525, & 16397, Langsdorff s.n., Martius s.n., Mendonça 324, Mosén 766, Pohl 2033, Riedel 395, Sellow C.264 & s.n., A. Silveira 1563, and Widgren s.n. from Minas Gerais, Brazil, and Pavon s.n. from Huánuco, Peru. He comments that the "Species valde variabilis. Varietates a cl. Koernicke collocatae: minor et major gradu modo diversae atque formis intermediis conjunctae, melius excludendae sunt, var. alpestris autem foliis glaberrimis et bracteis involucrentibus fere acutis satis diversa."

Silveira (1928) cites A. Silveira 229 from Serra de Treituba, Minas Gerais, collected in 1897; Teague (1965) cites Teague 160. Macbride (1936) cites from Peru the following: Amazonas: Weberbauer 4531. Cajamarca: Raimondi s.n. [Cutervo]. Huánuco: Pavon s.n. [Pillao]; Weberbauer 3535.

Material of P. planifolius has been misidentified and distrib-

uted in some herbaria under the names Eriocaulon kunthii Körn., Paepalanthus globulifer Alv. Silv., and P. planifolius var. conduplicatus Ruhl. On the other hand, the Hassler 9428, distributed as P. planifolius, is actually Eriocaulon magnum Abbiatti; Mexia 5745 is P. planifolius var. conduplicatulus Ruhl.; A. Gehrt s.n. [Herb. Inst. Biol. S. Paulo 5766] is P. planifolius var. consanguineus (Körn.) Ruhl.; Anderson, Stieber, & Kirkbride 3620h, Brade 6587, G. Gardner 5269, Hatschbach 2494h, F. C. Hoehne 5475, Irwin, Maxwell, & Wasshausen 2018h, Maguire, Mendes Magalhães, & Maguire 49092, Reitz 5432, and Reitz & Klein 392h & 5376 are P. planifolius var. globulifer (Alv. Silv.) Moldenke & Smith; and Mermüller 25560 is P. planifolius var. puberulus (Körn.) Ruhl.

Additional citations: BRAZIL: Amazonas: Eiten & Eiten 5042 (Ld). Distrito Federal: Irwin & Soderstrom 5785 (N); Irwin, Souza, & Reis dos Santos 7902 (Ac, N); Maguire, Murça Pires, Maguire, & Silva 57056 (Ld). Minas Gerais: Anderson, Stieber, & Kirkbride 35770 (Ld, N, W—2709828); Andrade 1015 [Emmerich 976] (Bd—16653); Duarte 10543 [Herb. Brad. 47760] (Ld); Dusén 255 (S); Hatschbach, Smith, & Ayensu 28870 (Ac); Irwin, Maxwell, & Wasshausen 20775 (Ac, N); Macedo 2754 (S, S), 2851 (N); Magalhães Gomes 2813 [Herb. Jard. Bot. Belo Horiz. 26704] (N); Maguire, Mendes Magalhães, & Maguire 49145 (N, N), 49300 (N); Martius 840 (Mu), 1334 (Mu); Mendes Magalhães 482 [Herb. Jard. Bot. Belo Horiz. 34501] (N), 1982 (Be—14655, W—2124237), 2319 [Herb. Jard. Bot. Belo Horiz. 43365] (N), 2547 [Herb. Jard. Bot. Belo Horiz. 43830] (N); Mosén 766 [25/10/1873] (Mu, S, S, S), 766 [5/10/1875] (S); Princess Therese s.n. [Itacolumy, VIII.1888] (Mu); L. Riedel 395 (B—isotype, Ut—373—isotype); Sellow 1056 (B), C.264 [840] (B, B), s.n. (B); J. B. Silva 556 [Herb. Set. Lag. 693] (Ba); Tryon & Tryon 6783 (Ac); Widgren s.n. [1845] (S, S, W—936260), s.n. (S). Paraná: Dombrowski 1982 [Kuniyoshi 1707] (Ld), 2933 [Kuniyoshi 2413] (Ld), 3757 (Z); Dusén 2621 (S), 6947 (Mu, N, S), 13260 (S, S, W—1280826), 15571 (S, W—1470490); Hatschbach 5063 (Sm), 8261 (Ca), 25430 (Ft), 26328 (Ac, S), 27168 (Ld); Imaguire 221 (Ld); Pabst 6787 [E. Pereira 6946; Herb. Brad. 22003] (Lw). Rondônia: Maguire, Murça Pires, Maguire, & Silva 57056 (N). Santa Catarina: Reitz 5417 (N), 5604a (Ld); Reitz & Klein 10169 (Ac), 10560 (Ld); Smith, Reitz, & Klein 7959 (Ok). São Paulo: Brade 5529 (S), 12224 (S); G. Eiten 6384 (Ld); F. R. Fosberg 43330 (Ld); Guillemín 523 (P); Moldenke & Moldenke 19638 (N, Qu), 19646 (B, Fy, Rs, Ss); Pabst 4851 (Bd—11043), 5776 [E. Pereira 5949; Herb. Brad. 21959] (Lw); Segadas-Vianna 2690 [Lev. Fitosociol. 510430—0104] (Ja), 3124 (Ja), 3126 (Sm), 3188 (Sm); Viegas, Franco, & Lima s.n. [Herb. Inst. Agron. S. Paulo 5457] (Be—35545); Zerny s.n. [30 October 1927] (V—10783). State undetermined: Herb. Schwägrichen

s.n. [Brasilia] (Mu). PARAGUAY: Hassler 5163 (Ca--944899, N, S); T. Rojas 12939 (S). CULTIVATED: Brazil: Widgren 15 (S), 20 (S). MOUNTED ILLUSTRATIONS: drawings of specimens from Villa Riva and Tijuco (B); drawings & notes by Körnische (B); Körn. in Mart., Fl. Bras. 3 (1): pl. 52 (B, B, B, N, Z); Pohl, Fl. Bras. ined. (B).

PAEPALANTHUS PLANIFOLIUS var. ALPESTRIS Körn. in Mart., Fl. Bras. 3 (1): 413. 1863.

Synonymy: Paepalanthus planifolius f. alpestris Körn. ex Moldenke, Phytologia 26: 375, in syn. 1973.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 413 & 414. 1863; Ruhl. in Engl., Pflanzenreich 13 (4-30): 209 & 291. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 295. 1908; Alv. Silv., Fl. Mont. 1: 411. 1928; Moldenke, Known Geogr. Distrib. Erioc. 5 & 52. 1946; Moldenke, Alph. List Cit. 2: 612 (1948) and 3: 833 & 903. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 61, 86, & 211. 1949; Moldenke, Phytologia 3: 142 (1949) and 4: 152 & 201. 1953; Moldenke, Résumé 68, 101, & 489. 1959; Moldenke, Résumé Suppl. 18: 4. 1969; Moldenke, Fifth Summ. 1: 118 & 165 (1971) and 2: 956. 1971.

According to Ruhland (1903) this variety "Differt a forma typica foliis glaberrimis, bracteis involucrentibus acutiusculis". He cites only the type collection, Schlim 554, from páramos in "Prov. Ocana", Antioquia, Colombia, at 3000--3330 meters altitude, flowering in May. Core found it to have a "thick woody root in Sphagnum and a close rosette of many stiff leaves". He describes the flowers as white. It has also been encountered in woodland bogs and collected in anthesis in March, May, July, and August and in fruit in July and August.

The Brade 7194 [Herb. Inst. Biol. S. Paulo 6587], distributed as var. alpestris, is actually var. globulifer (Alv. Silv.) Moldenke & Smith. Silveira cites (1928) a Collector undetermined 230 from Itacolumni de Ouro Preto, Minas Gerais, Brazil, collected in 1896, but it is extremely doubtful to me that this is correctly identified.

Additional citations: COLOMBIA: Antioquia: Barkley & Saldarriaga C. 43036 (Ac, Gz, Ld); E. L. Core 386 (W--2059695, We). Cundinamarca: F. A. Barkley 38962 (Ld, Z). MOUNTED CLIPPINGS: Ruhl. in Engl., Pflanzenreich 13 (4-30): 209. 1903 (B, N).

PAEPALANTHUS PLANIFOLIUS var. CONDUPLICATULUS Ruhl. in Engl., Pflanzenreich 13 (4-30): 210 [as "conduplicatula"]. 1903.

Synonymy: Paepalanthus planifolius var. conduplicatula Ruhl. in Engl., Pflanzenreich 13 (4-30): 210. 1903. Paepalanthus planifolius var. conduplicata Ruhl. ex Beauverd, Bull. Herb. Boiss., ser. 2, 8: 295, sphalm. 1908. Paepalanthus planifolius var. conduplicatus Ruhl. ex Moldenke, Known Geogr. Distrib. Erioc. 14 & 52, sphalm. 1946. Paepalanthus planifolium var. conduplicatulus Ruhl. ex Angely, Fl. Anal. Paran., ed. 1, 200, sphalm. 1965. Paepalan-

thus planifolium var. conduplicatus Ruhl. ex Moldenke, Fifth Summ. 2: 588, in syn. 1971.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 414. 1863; Ruhl. in Engl., Pflanzenreich 13 (4-30): 210 & 291. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 295. 1908; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40 & 53. 1930; Moldenke, Known Geogr. Distrib. Erioc. 14 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 86 & 211. 1949; Moldenke, Alph. List Cit. 4: 1301. 1949; Moldenke, Phytologia 3: 142 (1949) and 4: 201. 1953; Angely, Fl. Paran. 10: 14. 1957; Moldenke, Résumé 101, 327, & 489. 1959; Angely, Fl. Paran. 16: 66 (1960) and 17: 24. 1961; Angely, Fl. Anal. Paran., ed. 1, 200. 1965; Moldenke, Résumé Suppl. 18: 13. 1969; Moldenke, Fifth Summ. 1: 165 (1971) and 2: 580, 588, & 956. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1159 & Ind. 21. 1972; Moldenke, Phytologia 26: 28 & 236 (1973) and 29: 306. 1974.

According to Ruhland (1903) this variety "Differt a forma typica foliis angustioribus glabris, subconduplicatis" and is based on P. Clausen 267a from Pico d'Itabira, Minas Gerais, Brazil, deposited in the herbarium of the Jardin Botanique National de Belgique in Brussels. He cites only this original collection.

Miss Mexia describes the plant as a "frequent perennial herb" with white flowers, and found it growing in clumps on open sandy banks at riversides, at 1150 meters altitude, flowering and fruiting in May.

Material has been misidentified and distributed in some herbaria under the names P. kunthii Körn. or typical P. planifolius (Bong.) Körn. On the other hand, the P. Clausen 267, distributed as this variety, is actually P. conduplicatus Körn., while Magalhães Gomes 2813 [Herb. Jard. Bot. Belo Horiz. 26704] and Moldenke & Moldenke 19638 are typical P. planifolius (Bong.) Körn.

The Mexia 5745 collection seems to be a mixture of var. conduplicatus and var. globulifer; Killip in 1935 noted on the U. S. National Herbarium sheet of this number: "Paep. near conduplicatus (Glas. 15525) at Paris".

Additional citations: BRAZIL: Minas Gerais: Mexia 5745, in part (N, S). Paraná: Dusén 15650 (S, S).

PAEPALANTHUS PLANIFOLIUS var. CONSANGUINEUS (Körn.) Ruhl. in Engl., Pflanzenreich 13 (4-30): 210 [as "consanguinea"]. 1903.

Emended synonymy: Paepalanthus consanguineus Körn. in Mart., Fl. Bras. 3 (1): 411-412. 1863. Platycaulon consanguineum Körn. ex V. A. Pouls., Vidensk. Meddel. Kjøbenh. 1888: 292. 1888. Dupatya consanguinea (Körn.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatya consanguinea Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus planifolius var. consanguinea (Körn.) Ruhl. in Engl., Pflanzenreich 13 (4-30): 210. 1903. "Paepalanthus planifolius var. consanguinea (Körn.)" ex Beauverd, Bull.

Herb. Boiss., ser. 2, 8: 295. 1908. Eriocaulon consanguineum Ruhl. ex Mendes Magalhães, Anais V Reun. Anual Soc. Bot. Bras. 242--243. 1956 [not E. consanguineum Kunth, 1841]. Paepalanthus consanguineus Körn. ex Rennó, Levant. Herb. Inst. Agron. 70, sphalm. 1960.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 411--412 & 506. 1863; V. A. Pouls., Vidensk. Meddel. Kjøbenh. 1888: 292. 1888; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 401. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 210, 211, [283], 289, & 291. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 295. 1908; Alv. Silv., Fl. Mont. 1: 405. 1928; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 14, 29, 47, & 52. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 401. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 86 & 211. 1949; Moldenke, Phytologia 4: 201. 1953; Mendes Magalhães, Anais V Reun. Anual Soc. Bot. Bras. 242--243. 1956; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 101, 279, 324, 327, 335, & 489. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 401. 1960; Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960; Moldenke, Résumé Suppl. 3: 34 (1962) and 17: 9. 1968; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 160, 174, & 189. 1969; Moldenke, Fifth Summ. 1: 165 & 479 (1971) and 2: 497, 580, 588, 604, & 956. 1971; Moldenke, Phytologia 30: 112. 1975.

According to Ruhland (1903) this variety "Differt a forma typica foliis subtus glabris, supra pilis longiusculis praeditis, bracteis involucrentibus ovatis, acutis, laetius quam in praecedente [var. puberula (Körn.) Ruhl.] fuscis". The variety is based on Sellow s.n. from somewhere in Minas Gerais, Brazil, and deposited in the herbarium of the Botanisches Museum in Berlin. Silveira (1928) cites A. Silveira 231 from the Serra do Cipó, Minas Gerais, while Ruhland (1903) cites the type collection and W. Schwacke 11989 from the Serra do Ouro Preto, Minas Gerais, "an Bäckern.....blühend im September 1893: 'specierum omnium frequentissima'". Mendes Magalhães (1956) asserts that it blooms from August to October.

The Eriocaulon consanguineum of Kunth, referred to in the synonymy above, is a synonym of Eriocaulon sexangulare L.

My wife and I encountered P. planifolius var. consanguineus growing in handsome profusion in a wet, sandy, fog-enshrouded campo at 800 meters altitude in São Paulo. The plant has been collected in anthesis in September and October and in fruit in September.

Material of this variety has been distributed and even previously cited by me as typical P. planifolius (Bong.) Körn. or as P. planifolius var. puberulus (Körn.) Ruhl.

Citations: BRAZIL: Minas Gerais: Santos & Machado 260 [N. Santos 5951] (Ja); Schwacke 11989 (B); Sellow s.n. (B-type, Z-isotype). São Paulo: A. Gehrt s.n. [Herb. Inst. Biol. S. Paulo 5766] (N); Moldenke & Moldenke 19637 (B, Es, F, Fy, Lg, Mg, Mr, N, No, Or, S,

Sm, Ss). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

*PAEPALANTHUS PLANIFOLIUS* var. *GLOBULIFER* (Alv. Silv.) Moldenke & Smith ex Moldenke, *Phytologia* 26: 355. 1973.

Synonymy: *Paepalanthus globulifer* Alv. Silv., *Fl. Mont.* 1: 240-241, pl. 160. 1928.

Bibliography: Alv. Silv., *Fl. Mont.* 1: 240-241 & 407, pl. 160. 1928; Wangerin in Just, *Bot. Jahresber.* 57 (1): 476. 1937; A. W. Hill, *Ind. Kew. Suppl.* 9: 199. 1938; Worsdell, *Ind. Lond. Suppl.* 2: 183. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 12 & 49. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; Moldenke, *Résumé* 98 & 487. 1959; Rennó, *Levant. Herb. Inst. Agron. Minas* 70. 1960; Moldenke, *Fifth Sjm.* 1: 162 (1971) and 2: 952. 1971; Moldenke, *Phytologia* 25: 229 (1973), 26: 355 (1973), 28: 439 (1974), and 29: 306. 1974.

Illustrations: Alv. Silv., *Fl. Mont.* 1: pl. 160. 1928.

According to Silveira (1928) this taxon "*cum P. planifolius affinis esse videtur, sed pedunculis gracilibus, vaginis folia subaequantibus et statura humiliore diversa*". It is based on *Silveira* 551, collected "In campis humidis in serra do Cipó", Minas Gerais, Brazil, in April of 1909 and is deposited in the Silveira herbarium.

Collectors describe the plant as a tufted herb, the inflorescences to 50 cm. tall, and the flower-heads and flowers white. They have found it growing in fields, on campos, wet or marshy campos, wet places in general, in wet sand of grassland and sedge-land (with shrubby areas) with sandstone and quartzite rocks and derived soils, in open marshy ground with scattered low shrubs and low treeferns, periodically burned, and in areas of steep sandy slopes with sandstone outcrops at the summit, at altitudes of 200 to 1300 meters, flowering and fruiting from January to April, August, and October, flowering also in November. Anderson and his associates encountered it in a sandy meadow in an area of rocky campo and cerrado sloping down to wet-sand meadows adjacent to a gallery forest along a stream, in sandy soil and sandstone outcrops. Reitz & Klein found it growing "beira rio" and describe it as an "erva, flôr branca".

Material of this variety has been misidentified and distributed in some herbaria under such names as typical *P. planifolius* (Bong.) Körn., *P. planifolius* f. *alpestris* Körn., *P. planifolius* var. *alpestris* Körn., and *P. planifolius* var. *puberulus* (Körn.) Ruhl. On the other hand, the *Mendes Magalhães* 2319, distributed as this taxon, is actually typical *P. planifolius* (Bong.) Körn., while *Mexia* 5745 seems to consist of a mixture of var. *globulifer* and var. *conduplicatulus* Ruhl.

Citations: BRAZIL: Minas Gerais: *Anderson, Stieber, & Kirkbride* 36204 (Ac, N, W-2709844); *Irwin, Maxwell, & Wasshausen* 20184 (Ld, N); *Macedo* 2973 (N, S); *Maguire, Mendes Magalhães, & Maguire* 49092 (N); *Mendes Magalhães* 2319 [*Herb. Jard. Bot. Belo Horiz.* 43365] (N),

2549 [Herb. Jard. Bot. Belo Horiz. 43834] (N); Mexia 5745, in part (W--1571900); Murça Pires & Black 2802 (N); Tryon & Tryon 6766 (Z). Paraná: Hatschbach 24944 (Ld, S), 32597 (Ld). Santa Catarina: Reitz 5432 [HBR. 6344] (N, N, N); Reitz & Klein 3924 (Ld), 5376 (N, Ok), 10060 (Ld), 10368 (Ac). São Paulo: Brade 6587 (Mu), 7194 [Herb. Inst. Biol. S. Paulo 6587] (N); G. Eiten 6384 (W--2688337); A. Gehrt 5766 (Mu); F. C. Hoehne 5475 (Mu). State undetermined: G. Gardner 5269 (N).

PAEPALANTHUS PLANIFOLIUS var. PUBERULUS (Körn.) Ruhl. in Engl., Pflanzenreich 13 (4-30): 209 [as "puberula"]. 1903.

Synonymy: Paepalanthus puberulus Körn. in Mart., Fl. Bras. 3 (1): 410--411. 1863. Dupatya puberula (Körn.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya puberula Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus planifolius var. puberula (Körn.) Ruhl. in Engl., Pflanzenreich 13 (4-30): 209. 1903. "Paepalanthus planifolius var. puberula (Körn.)" ex Beauverd, Bull. Herb. Boiss., ser. 2, 8: 295. 1908. Paepalanthus puberulus var.  $\alpha$  Körn. ex Moldenke, Résumé Suppl. 1: 22, in syn. 1959. Platycaulon intermedium Körn. ex Moldenke, Résumé Suppl. 1: 22, in syn. 1959.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 410--411 & 506. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 209, 211, 212, 284, & 291. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 295. 1908; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 14, 31, 52, & 53. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 86 & 211. 1949; Moldenke, Alph. List Cit. 4: 1301. 1949; Moldenke, Phytologia 4: 201. 1953; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 101, 281, 327, & 489. 1959; Moldenke, Résumé Suppl. 1: 22. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Phytologia 20: 368. 1970; Moldenke, Fifth Summ. 1: 165 & 484 (1971) and 2: 588, 589, 604, & 956. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1159 & Ind. 21. 1972; Moldenke, Phytologia 30: 112. 1975.

According to Ruhland (1903) this variety "Differt a forma typica foliis puberulis, bracteis involucrentibus latioribus, acuminatis vel acutis, dorso puberulis". It is based on Sellow s.n., collected "bei Rio das Pedras und anderwärts", Minas Gerais, Brazil, flowering in October, and is deposited in the Berlin herbarium. The names P. puberulus var.  $\alpha$  and Platycaulon intermedium are both apparently based on Sellow 22a, also in the Berlin herbarium.

The species has been collected at 2450 meters altitude, flowering in March, April, September, October, and December, and fruiting in December. Ruhland (1903) cites also A. Silveira 2064 [probably

a misprint for "2964"] from Minas Gerais, and Burchell 3797, Glaziou 11631, and Schwacke 654 from São Paulo. Collectors report the plant growing in damp places on campos.

The Brade 7194 [Herb. Inst. Biol. S. Paulo 6587], previously cited by me as representing this variety, seems better regarded as var. globulifer (Alv. Silv.) Moldenke & Smith.

Additional citations: BRAZIL: Minas Gerais: Merxmüller 25560 (Mu); A. Silveira 2964 (B); Sellow 22a (B, B), s.n. [Rio des Piedras] (B--type, B--isotype); Strang 25410 [Herb. Cent. Pesq. Florest. 4218] (Z). São Paulo: Brade 5527 (S). MOUNTED ILLUSTRATIONS: drawings & notes by Körnigke (B, B).

PAEPALANTHUS PLANIFOLIUS var. VILLOSUS Moldenke, *Phytologia* 29: 503. 1974.

Bibliography: Moldenke, *Phytologia* 29: 503. 1974.

This variety differs from the typical form of the species and from all other described varieties in having its short (10—15 cm. long) leaves puberulent above and densely long-villous beneath with weak, soft, gray, irregularly disposed hairs which are quite conspicuous and persistent on dried specimens.

Citations: BRAZIL: São Paulo: F. R. Fosberg 43331 (Z--type).

PAEPALANTHUS PLANTAGINEUS (Bong.) Körn. in Mart., *Fl. Bras.* 3 (1): 369—370. 1863.

Synonymy: Eriocaulon plantagineum Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 1: 625. 1831. Paepalanthus zosterifolius Kunth, *Enum. Pl.* 3: 504. 1841. Eriocaulon zosteriaefolium (Kunth) D. Dietr., *Syn. Pl.* 5: 259—260. 1852. Eriocaulon zosteriaefolium Kunth ex Steud., *Syn. Pl. Glum.* 2: [Cyp.] 277 & 334. 1855. Paepalanthus breviscapus Mart. ex Körn. in Mart., *Fl. Bras.* 3 (1): 370, in syn. 1863. Paepalanthus radicans Mart. ex Körn. in Mart., *Fl. Bras.* 3 (1): 370, in syn. 1863. Paepalanthus plantagineus Körn. in Mart., *Fl. Bras.* 3 (1): 369. 1863; V. A. Pouls., *Vidensk. Meddel. Kjøbenhavn.* 1888: 306. 1888. Paepalanthus plantagineus var. ♂ Körn. in Mart., *Fl. Bras.* 3 (1): 370. 1863. Paepalanthus plantagineus var. ♀ Körn. in Mart., *Fl. Bras.* 3 (1): 370. 1863. Dupatya plantaginea (Bong.) Kuntze, *Rev. Gen. Pl.* 2: 746. 1891. Paepalanthus zosteriaefolius Kunth apud Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 625 & 880. 1893. Eriocaulon zosterifolius Steud. apud Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 880, in syn. 1893. Paepalanthus breviscapus Körn. apud Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 2: 401. 1894. Dupatya plantaginea Kuntze apud Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902. Eriocaulon breviscapum Mart. ex Moldenke, *Résumé* 286, in syn. 1959 [not E. breviscapum Körn., 1856].

Bibliography: Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 1: 625. 1831; Bong., *Ess. Monog. Erioc.* 25 (1831) and 68—69 & 231—232, pl. 17. 1832; Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*,

ser. 6, 2: 231—232, pl. 17. 1832; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 504, 574, 613, & 625. 1841; D. Dietr., Syn. Pl. 5: 259—260. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 277 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 369—370 & 507. 1863; V. A. Pouls., Vidensk. Meddel. Kjøbenh. 1888: 306. 1888; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879 & 880 (1893) and pr. 1, 2: 401 & 402. 1894; N. E. Br., Trans. Linn. Soc. Lond. Bot., ser. 2, 6: 71. 1901; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4—30): 124, 133—134, 136, 284, 286, 289, 291, & 292. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 287. 1908; Alv. Silv., Fl. Mont. 1: 411. 1928; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879 & 880 and pr. 2, 2: 401 & 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 14, 30, 38, 45, 52, 53, & 55. 1946; Moldenke, Alph. List Cit. 1: 106 (1946), 2: 412 (1948), and 3: 710 & 935. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 86 & 211. 1949; Moldenke, Phytologia 4: 201—202. 1953; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 101, 281, 286, 291, 294, 323, 327, 329, & 489. 1959; Moldenke, Résumé Suppl. 1: 22. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879 & 880 (1960) and pr. 3, 2: 401 & 402. 1960; Rennó, Levant. Herb. Inst. Agron. Minas. 71. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 147, 174, & 189. 1969; Moldenke, Phytologia 20: 7. 1970; Moldenke, Fifth Summ. 1: 165 & 484 (1971) and 2: 495, 508, 517, 518, 578, 588, 589, 592, 593, & 956. 1971; Moldenke, Phytologia 25: 158 (1973) and 29: 390. 1974. Illustrations: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 2: [Ess. Monog. Erioc.] pl. 17. 1832.

Bongard's original (1831) description of this species is "sub-acaulis; foliis lineari-lanceolatis acutis, subtus albicantibus; pedunculis vaginisque albicantibus glabris. Tab. XVII. Habitat in umbrosis saxosis montis Itacolumni. Floret Augusto. 4." The type appears to be L. Riedel 439 and is deposited in the Leningrad herbarium.

Kunth (1841) based his Paepalanthus zosterifolius on a Sellow collection from "Brasilia meridionalis", which is probably the Sellow s.n. — and probably also Sellow 1086 — in the Berlin herbarium. In describing it he indicated doubt as to its distinctness from Eriocaulon plantagineum Bong.: "Probabiliter a planta Bongardiana haud distincta, sed folia subtus vix pallidiora, nec albicantia".

Körnische (1863) divided P. plantagineum into two unnamed varieties. The typical variety he called var.  $\alpha$  and it is based on the Riedel collection (L. Riedel 439), described as "foliis superne levissime puberulis; bracteis involucrentibus miticis". His var.  $\beta$  is based on Paepalanthus zosterifolius Kunth "(excl. synonym.)" and is described as "foliis superne glabris; bracteis involucrentibus breviter apiculatis". He cites Sellow s.n. [in Brasilia orientali], Martius & Clausen 170 from "in prov. Minarum arenosis

mudiusculis ad Pires, Mariana, Cachoeira do Campo", and Clausen 67 from "in monte Itaculumni".

Paepalanthus breviscapus Mart. and P. radicans Mart. are both based on Martius 892 in the Munich herbarium, where it was photographed by Macbride as his type photograph number 18717.

Ruhland (1903) does not keep Körnicke's two varieties apart and cites for the species as a whole the Sellow s.n. from "Brasilia orientalis" and, from Minas Gerais, P. Clausen 67, Glaziou 15526, Magalhães Gomes 2992 & 3029, Martius & Clausen 170, L. Riedel 439, Sena s.n. [Herb. Schwacke 14322], A. Silveira 1509, and Ule 2716.

Collectors have found this plant growing in shady places, on rocky or damp rocky ground, between sandstone boulders, and on damp sandy ground among boulders, at 1100 meters altitude, flowering from February to April and in July and August. Ruhland (1903) notes the resemblance in habital aspect between this species and P. brunnescens Ruhl.

Jackson (1893) places Eriocaulon paludosum Bong. in the synonymy of P. plantagineus, but I feel that it is better placed in that of P. freyreysii (Billb.) Körn.

Silveira (1928) cites A. Silveira 244, collected at Itaculumni, Minas Gerais, in 1896.

Material of P. plantagineus has been misidentified and distributed in some herbaria under the name P. strictissimus Mart., which actually is a synonym of Syngonanthus nitens var. hirtulus Ruhl.

Additional citations: BRAZIL: Bahia: Glocker 333 (S). Minas Gerais: P. Clausen 13 [Herb. Kunth 67] (P), 43 [P.20] (N), s.n. (B, Br); Glaziou 15526 (W--1194907); Magalhães Gomes & Silveira 3029 [Herb. Jard. Bot. Belo Horiz. 26702] (N); L. Riedel 439 (B--isotype); Williams & Assis 6864 (S). State undetermined: Martius 892 [Macbride photos 18717] (B, Br, Mu, N--photo, W--photo, Z), 897 (Mu); Schenck s.n. [Brasilia] (B); Sellow 1086 (S), s.n. [Brasilia meridionalis] (B). MOUNTED ILLUSTRATIONS: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 2: 231--232, pl. 17. 1832 (N, Z); drawings & notes by Körnicke (B).

PAEPALANTHUS PLANTAGINEUS f. LUXURIANS Beauverd, Bull. Herb.

Boiss., ser. 2, 8: 287. 1908.

Bibliography: Beauverd, Bull. Herb. Boiss., ser. 2, 8: 287. 1908; Moldenke, Known Geogr. Distrib. Erioc. 44 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Moldenke, Résumé 101 & 489. 1959; Moldenke, Fifth Summ. 1: 165 (1971) and 2: 956. 1971.

Beauverd (1908) describes this form as follows: "differt a typo habitu robustiore; caule longiore; foliis latioribus basi 7--8 mm. medio 5--6 mm. lat.), pedunculis numerosissimis (circa 28 cm.), foliis duplo longioribus (17--20 cm.); capitulis majoribus (5--6 mm. diam.)." It is based on L. Damazio 1844a from "Sur les rochers,

Serra do Fresão", Minas Gerais, Brazil, collected on March 26, 1907, and deposited in the Herbarium Boissier at Geneva. He observes that "Cette forme intéressante de beaucoup la plus luxuriante de toutes celles que nous avons examinées dans l'herbier Boissier, n'offre pas de caractères suffisants pour être distinguée comme variété: sauf la longueur des péduncles, tous les autres organes végétatifs conservent, avec des dimensions plus fortes les mêmes proportions que chez le type. -- Celui-ci, du reste, a été signalé dans la même Serra de Fraso, au sommet de la montagne, c. 1100 m. d'altitude."

Thus far it is known only from this original collection.

PAEPALANTHUS PLANTAGINIOIDES (Desv.) Körn. in Mart., Fl. Bras. 3 (1): 470 [as "plantaginoides"]. 1863.

Synonymy: Eriocaulon plantaginioides Desv. ex W. Hamilt., Prod. Ind. Occ. 16. 1825. Eriocaulon plantaginoides Hamilt. ex Kunth, Enum. Pl. 3: 572. 1841. Paepalanthus plantaginoides Körn. in Mart., Fl. Bras. 3 (1): 470 & 507. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894. Dupatya plantaginoides (Hamilt.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya plantaginoides Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus plantaginoides (Hamilt.) Körn. ex Ruhl. in Engl., Pflanzenreich 13 (4-30): 279 & 291. 1903. Dupatya plantaginoides Kuntze ex Ruhl. in Engl., Pflanzenreich 13 (4-40): 279 & 284, in syn. 1903. Eriocaulon plantaginioides Hamilt. ex Moldenke, Known Geogr. Distrib. Erioc. 38, in syn. 1946. Paepalanthus plantaginoides Desv. ex Moldenke, Known Geogr. Distrib. Erioc. 52, in syn. 1946. Eriocaulon plantaginoides Desv. ex Moldenke, Résumé Suppl. 17: 10, in syn. 1968.

Bibliography: W. Hamilt., Prod. Pl. Ind. Occ. 16. 1825; Kunth, Enum. Pl. 3: 572 & 613. 1841; D. Dietr., Syn. Pl. 5: 266. 1852; Körn. in Mart., Fl. Bras. 3 (1): 470 & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879 (1893) and pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 279, 284, 286, & 291. 1903; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1911; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 6, 30, 38, & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 66 & 211. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 281, 291, 327, & 489. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879 (1960) and pr. 3, 2: 402. 1960; Moldenke, Résumé Suppl. 17: 10 (1968) and 18: 9. 1969; Moldenke, Phytologia 20: 297. 1970; Moldenke, Fifth Summ. 1: 130 & 484 (1971) and 2: 508, 509, 588, & 956. 1971.

Hamilton's original (1825) description of this taxon is "Surcul. brevi erecto folioso; fol. patentibus lineari-lanceolatis margine ciliatis; scap. fasciculato-patulis; cal. commun. argenteo-scaris-

oso. E. plantaginoides. Herb. Prof. Desv. Guyana. (S. v.)". Nothing else is known to me of this plant.

PAEPALANTHUS PLATYCAULIS Alv. Silv., Fl. Mont. 1: 27--28, pl. 11. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 27--28 & 411, pl. 11. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 14 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Moldenke, Résumé 101 & 489. 1959; Moldenke, Fifth Summ. 1: 165 (1971) and 2: 956. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 11. 1928.

This species is based on A. Silveira 807 from "In campis prope Itacambira", Minas Gerais, Brazil, collected in July, 1926, and deposited in the Silveira herbarium. Silveira (1928) comments that the "Species a P. eriophaeo Ruhl. ob pedunculos foliis breviores, capitula minora et alios acharacteres differt". It is known thus far only from the original collection.

PAEPALANTHUS PLUMIPES Alv. Silv., Fl. Mont. 1: 201--203, pl. 133. 1928.

Synonymy: Paepalanthus maximus Macedo ex Moldenke, Résumé Suppl. 1: 21, in syn. 1959.

Bibliography: Alv. Silv., Fl. Mont. 1: 201--203 & 411, pl. 132. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 14 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Moldenke, Résumé 101 & 489. 1959; Moldenke, Résumé Suppl. 1: 21. 1959; Moldenke, Fifth Summ. 1: 165 (1971) and 2: 586 & 956. 1971; Moldenke, Phytologia 25: 157 (1973), 28: 439 (1974), and 29: 307. 1974.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 132. 1928.

This species is based on A. Silveira 594 from "In pratis arenosis siccisque in Serra do Cabral", Minas Gerais, Brazil, collected in June, 1910, and deposited in the Silveira herbarium. On page 411 of his work (1928) Silveira cites the year of collection as "1920", but whether this is intended as a correction of the date given in the original description or is a typographic error, is not clear. Paepalanthus maximus is based on Macedo 2950 in the Stockholm herbarium.

Paepalanthus plumipes is obviously very closely related to P. polyanthus (Bong.) Kunth and perhaps should, rather, be reduced to varietal rank. In P. plumipes, which seems to be confined to the Serra do Cabral and Serra do Cipó, the cauline leaves are mostly strictly erect and rather closely appressed to the branches, rather bluntish at the apex, not attenuate-elongate nor abruptly spreading, and the hairs on the peduncles are very dense, very conspicuous, almost twice as long and very wide-spreading at about right angles to the peduncles. In P. polyanthus the cauline leaves

are mostly conspicuously attenuate-acuminate to the spreading or even widely divergent apex, not appressed for their entire length, and the hairs on the peduncles are half as long, not as conspicuous, and mostly subappressed or ascending at an acute angle.

Paepalanthus plumipes has been found growing in campos and on campo slopes in areas of sandy campo with outcrops, at altitudes of 1200 to 1300 meters, flowering from December to February and in April. Recent collectors describe it as having stems about 1 meter tall.

Material of P. plumipes has been misidentified and distributed in some herbaria as P. robustus Alv. Silv. On the other hand, the Irwin, Maxwell, & Wasshausen 20701, distributed in at least some herbaria as P. plumipes, is actually P. coutoënsis Moldenke, while Belém 3544 & 3840, Irwin, Maxwell, & Wasshausen 20046 & 20662, Irwin, Reis dos Santos, Souza, & Fossêca 22026, and Maguire, Maguire, & Murça Pires 44763 are P. polyanthus (Bong.) Kunth and Irwin, Maxwell, & Wasshausen 20532 and Tryon & Tryon 6782 are P. robustus Alv. Silv. The Irwin, Maxwell, & Wasshausen 20031, cited below, is a mixture with P. bromelioides Alv. Silv.

Citations: BRAZIL: Minas Gerais: Irwin, Maxwell, & Wasshausen 20031, in part (Ld, N); Macedo 2950 (S, S), s.n. [Serra do Cipó, 15-I-951] (N); Maguire, Maguire, & Murça Pires 44706a (N, N); Mello Barreto 2518 [Herb. Jard. Bot. Belo Horiz. 10676; Herb. U. S. Nat. Arb. 236372] (W--2109987); Murça Pires & Black 2713 (N, N); Smith, Segadas-Vianna, Egler, Dau, Lopez da Silva, Ormond, & Machline 6834 [L. B. Smith 6834] (N, N).

PAEPALANTHUS PLUMOSUS (Bong.) Körn. in Mart., Fl. Bras. 3 (1): 337--338. 1863.

Synonymy: Eriocaulon plumosum Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 632. 1831. Eriocaulon stellare Guill. in Deless., Icon. Select. 3: 59--60, pl. 97. 1837. Paepalanthus stellaris (Guill.) Kunth, Enum. Pl. 3: 525. 1841. Paepalanthus mollis Kunth, Enum. Pl. 3: 507. 1841. Eriocaulon molle Kunth ex D. Dietr., Syn. Pl. 5: 260. 1852 [not E. molle Mart., 1863]. Paepalanthus plumosus Körn. in Mart., Fl. Bras. 3 (1): 337. 1863. Paepalanthus plumosus var. ♂ Körn. in Mart., Fl. Bras. 3 (1): 337--338. 1863. Paepalanthus plumosus var. ♀ Körn. in Mart., Fl. Bras. 3 (1): 337--338. 1863. Paepalanthus plumosus var. ♀ Körn. in Mart., Fl. Bras. 3 (1): 338. 1863. Paepalanthus plumosus var. ♂ Körn. in Mart., Fl. Bras. 3 (1): 337--338. 1863. Paepalanthus nigrifella Mart. ex Körn. in Mart., Fl. Bras. 3 (1): 337. in syn. 1863. Paepalanthus caryophyllus Mart. ex Körn. in Mart., Fl. Bras. 3 (1): 337, in syn. 1863. Eriocaulon molle Steud. apud Körn. in Mart., Fl. Bras. 3 (1): 337, in syn. 1863. Dupatya plumosa (Bong.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Paepalanthus

*stellaris* Kunth apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894. *Dupatya plumosa* Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. *Paepalanthus leontopodium* Mart. ex Moldenke, Résumé Suppl. 1: 21, in syn. 1959. *Paepalanthus stellaris* var.  $\alpha$  Körn. ex Moldenke, Résumé Suppl. 1: 22, in syn. 1959. *Paepalanthus stellaris* var.  $\beta$  Körn. ex Moldenke, Résumé Suppl. 1: 22, in syn. 1959. *Paepalanthus stellaris* var.  $\gamma$  Körn. ex Moldenke, Résumé Suppl. 1: 22, in syn. 1959. *Paepalanthus stellaris* var.  $\delta$  Körn. ex Moldenke, Résumé Suppl. 1: 22, in syn. 1959.

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 632. 1831; Bong., Ess. Monog. Erioc. 32. 1831; Guill. in Deless., Icon. Select. 3: 59—60 & 67, pl. 97. 1837; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 507, 525, 577, 613, 614, & 625. 1841; Hook. f., Niger Fl. 548. 1849; D. Dietr., Syn. Pl. 5: 260, 262, & 267. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 281, 282, & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 337—339, 502, & 507, pl. 57 IV. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 & 879 (1893) and pr. 1, 2: 401 & 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 9, 214, 219—220, 284, 286, 287, 289, 291, & 292. 1903; Alv. Silv., Fl. Mont. 1: 411. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 53. 1930; Stapf, Ind. Lond. 3: 91 (1930) and 4: 519. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 15, 31, 37, 38, 40, 46, 51, 52, & 54. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 & 879 (1946) and pr. 2, 2: 401 & 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87, 88, & 211. 1949; Moldenke, Phytologia 4: 141 (1952) and 4: 202. 1953; Mendes Magalhães, Anais V Reun. Anual Soc. Bot. Bras. 236—237 & 276—277. 1956; Moldenke, Résumé 101, 102, 281, 290, 291, 293, 323, 324, 326—328, 489, & 490. 1959; Moldenke, Résumé Suppl. 1: 6, 18, 21, 22, & 26. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 & 879 (1960) and pr. 3, 2: 401 & 402. 1960; Rennó, Levant. Herb. Inst. Agron. Minas 71. 1960; Moldenke, Résumé Suppl. 12: 11. 1965; Moldenke, Phytologia 17: 494 & 495. 1968; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 166, 174, & 189. 1969; Moldenke, Fifth Summ. 1: 165 & 484 (1971) and 2: 506, 509, 514, 579, 585, 586, 591, & 956. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1159—1160 & Ind. 12 & 21. 1972; Moldenke, Phytologia 26: 251, 476, & 477. 1973.

Illustrations: Guill. in Deless., Icon. Select. 3: pl. 97. 1837; Körn. in Mart., Fl. Bras. 3 (1): pl. 57 IV. 1863.

The original description of this taxon by Bongard (1831) is "Acaule; foliis vaginis brevioribus, erectis, lanceolatis, acuminate, obtusis, subglabris; pedunculis vaginisque pilosis. Bong. — In saxosis Serra da Lapa (Brasilia.) — Squamae capituli extus atro-fuscae, intus albo-plumosae." The type is probably L.

Riedel 1046, deposited in the Leningrad herbarium. Paepalanthus mollis Kunth is apparently based on Sellow B.1294 C.268, deposited in the Berlin herbarium, although in his original description (1841) Kunth says only "Sellow" in citing the type. He gives a detailed description and then comments that "Habitu hic alienus, P. helichrysoidei affiniior?; similis quoque P. macrorrhizo et pilifero". Körnicke (1863) regards this Berlin specimen as representing his P. plumosus var. ♂ citing it as Sellow s.n. "in montibus Caraça et Itacolumni".

Paepalanthus stellaris is apparently based on a collection from the Serra do Frio, Minas Gerais, Brazil, in the Berlin herbarium, which Ruhland (1903) seems to regard as the same L. Riedel 1046 collection. Kunth (1841) comments that it is "Ab Eriocaulone elychnysoide Bong., cui valde similem dicit amic. Guillemin, longe diversus". Steudel (1855), on page 334 of his work, refers to Eriocaulon stellare as his species no. "194", but this is an error -- it is actually species no. 195 on page 282.

According to Körnicke (1863) his P. plumosus var. ♀ is based on Sellow s.n. from Monte Caraça, Minas Gerais, flowering in December. He also annotated Schwacke 8499 in the Berlin herbarium as representing this variety. His var. ♀ and P. caryophyllus Mart. are both based on P. Clausen 172 in the Berlin herbarium and he also annotated Ule 2729 in that herbarium as representing this variety. Paepalanthus nigritella is based on Martius s.n. in the Munich herbarium where it was photographed by Macbride as his type photograph number 18718.

The Eriocaulon molle of Martius, referred to in the synonymy above, is a synonym of Eriocaulon crassiscapum Bong. The name Paepalanthus leontopodium Mart. was used by Körnicke on a drawing numbered "10.IV.H.30" in the Berlin herbarium and also labeled by him there as P. plumosus var. ♂.

Collectors have encountered P. plumosus growing on campos or dry campos, on mountain summits, in rocky places, on sandstone, and in wet sand, at 1400--2500 meters altitude, flowering from February to April, in June, October, and December. Mendes Magalhães (1956) avers that it blooms from April to November. Mrs. Chase found it "in wettish sand by a tiny streamlet near summit of open serra".

Jackson (1893) and other authors cite a plate "62" in the original work by Bongard (1831), but Kunth (1841) asserts that this plate was never actually published and it is not cited by Stapf (1930). It probably exists only in the Leningrad library or herbarium. The specific epithet of P. caryophyllus is often written with a capital initial letter.

It is probably worthwhile to repeat here the descriptions given by Körnicke (1863) for his infraspecific taxa under P. plumosus. His var. ♂ is described as having "foliis lanceolatis vel lanceolato-linearibus, acutiusculis vel obtusis, utrinque glabriusculis

*ciliolatis crassiusculis*, subtus nervo laterali marginatis, 1--3 poll. longis, medio  $1\frac{1}{4}$  -- 2 lin., basi 2--4 lin. latis; pedunculis 5--12 pollicaribus; capitulis 5--12 lin. latis." This is obviously what he regarded as the typical variety of the species, citing for it as synonyms: *Eriocaulon plumosum* Bong., *E. stellare* Guill., *Paepalanthus stellaris* Kunth, and *P. nigritella* Mart.

(the initial letter of the specific epithet of the last-mentioned name is uppercased by him), and citing as specimens examined: "in Brasilia: Princ. Neovid.; in prov. Minarum ad Serro Frio, in saxosis Serra da Lapa: Riedel no. 1046."

His var.  $\Phi$  is described as having "foliis linearibus, acutis, subtus glabriusculis, supra levissime puberulis, 1--2 poll. longis, medio  $\frac{3}{4}$  -- 1, basi 1--2 lin. latis; pedunculis inferne pilosis supra pubescentibus, 6--8 pollicaribus; capitulis 5--6 lin. latis", citing no synonyms and as specimens seen only "in monte Caraça, Decembri: Sellow."

His var.  $\Upsilon$  is described as having "foliis lanceolati-linearibus, acutis, subtus puberulis, supra pilis brevioribus pubescentibus,  $1\frac{1}{2}$  -- 2 poll. longis, medio 2 lin. latis, basi latioribus; pedunculis pilis arrectis pubescentibus  $2\frac{1}{2}$  -- 3-pollicaribus et paullo longioribus; capitulis 4 lin. et quod excedit latis", citing *P. caryophyllus* Mart. as a synonym and as specimens seen only "in prov. Minarum, inter m. Augusti et Aprilis: Clausen no. 172."

His var.  $\delta$  is described as having "foliis linearibus obtusiusculis vel acutis, subtus puberulis vel subpubescentibus, supra molliter denseque pubescentibus  $\frac{3}{4}$  --  $1\frac{3}{4}$  poll. longis, medio  $\frac{3}{4}$  --  $1\frac{1}{4}$  lin. latis, basi paullo latioribus; pedunculis pilis arrectis dense pubescentibus 3--5-pollicaribus; capitulis 3--4 lin. latis", citing as synonyms *Eriocaulon molle* Steud. and *Paepalanthus mollis* Kunth, and as specimens seen only "in montibus Caraça et Itacolumni: Sellow."

In regard to these proposed varieties of Körnicke, Ruhland (1903) says: "Cl. Koernicke....hujus speciei varietates 4, praesertim foliis latioribus aut longioribus, indumento plus vel minus evoluto, capitulorum magnitudine distinctas constituit. Multis speciminibus examinatis non est dubium, quin varietates illae formis multis intermediis conjunctae sint. Species huius subgeneris variabilissima." He cites from Minas Gerais: *P. Clausen* 172; *Glaziou* 15510, 15551, 15552, 15553, & 19969; *Magalhães Gomes* 631; *L. Riedel* 1046; *Schwacke* 8499; *Sellow* 1315 & s.n. (Itacolumni); *Sena* s.n. [Herb. Schwacke 14250 & 15145]; *Ule* 2729; and *Wied-Neuwied* s.n. *Silveira* (1928) cites Collector undetermined 261 from Ouro Preto, Minas Gerais, collected in 1895.

The *Foster & Mello Barreto* 10841 cited by me in 1953 is now regarded by me as representing *P. senaeanus* Ruhl., a very similar species. The *Martius* 877, distributed in some herbaria as *P. plumosus*, is actually *P. elongatus* var. *ciliatus* Körn., while *Martius* s.n. [arenosis apricis ad Vao do Paruán et alibi] is a mixture of

P. elongatus (Bong.) Körn. and its var. ciliatus Körn.

Additional citations: BRAZIL: Minas Gerais: M. A. Chase 10359 (W--1495691); Glaziou 19969 (W--1194906); F. C. Hoehne s.n. [Herb. Inst. Bot. S. Paulo 4950] (Mu, N); Magalhães Gomes 956 (N); Martius s.n. [Herb. Monac. 176; Macbride photos 18718] (Mu, N--photo, W--photo); Mello Barreto & Brade 1048 [Herb. Jard. Bot. Belo Horiz. 10740; Herb. U. S. Nat. Arb. 236381] (W--2109962); Mendes Magalhães 1983 [Herb. Jard. Bot. Belo Horiz. 42101] (Be--14075, N); Schwacke 8499 (B); Sellow 1315 (B), 1319 (B, B), B.1294 C.268 (B); Smith, Segadas-Vianna, Egler, Dau, Lopes da Silva, Ormond, & Machline 6834 [L. B. Smith 6834] (S); Ule 2729 (B). São Paulo: Glaziou 15553 (N). State undetermined: J. E. Pohl s.n. [in Brasilia] (Mu). MOUNTED ILLUSTRATIONS: drawings by Körnicke (B); Körn. in Mart., Fl. Bras. 3 (1): pl. 57 IV. 1863 (B, N, Z).

PAEPALANTHUS POLYANDRUS Alv. Silv., Fl. Mont. 1: 140--142, pl. 88. 1928.

Synonymy: Paepalanthus polyandros Alv. Silv., Fl. Mont. 1: 411. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 140--142 & 411, pl. 88. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Erioc. 15 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Moldenke, Résumé 101, 327, & 489. 1959; Moldenke, Fifth Summ. 1: 165 (1971) and 2: 588 & 956. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 88. 1928.

This species is based on A. Silveira 646, collected "In campis arenosis in Serra do Cabral", Minas Gerais, Brazil, in November, 1918, and deposited in the Silveira herbarium. On page 411 of his work Silveira (1928) gives the date of collection of the type specimen as "1917". If this is a misprint or is intended to be a correction of the date given in the original description is not clear.

The species is known thus far only from the original collection, and Silveira (1928) comments that "A P. variabilis Alv. Silv. cum quo magnam affinitatem habet, foliis ab initio fere glabris et bracteis involucrentibus lineari-lanceolatis praecipue differt."

PAEPALANTHUS POLYANTHUS (Bong.) Kunth, Enum. Pl. 3: 516. 1841.

Synonymy: Eriocaulon polyanthum Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 622, pl. 2. 1831 [not E. polyanthum Mart., 1841]. Paepalanthus polyanthos Kunth, Enum. Pl. 3: 625. 1841. Paepalanthus speciosus G. Gardn. in Hook. f., Icon. Pl. 6 [ser. 2, 2]: pl. 512. 1843 [not P. speciosus (Bong.) Körn., 1863, nor Körn., 1863]. Eriocaulon gardneri Steud., Syn. Pl. Glum. 2: [Cyp.] 274. 1855. Eriocaulon speciosum Gardn. ex Steud., Syn. Pl. Glum. 2: [Cyp.] 334, sphalm. 1855. Paepalanthus polyanthum Kunth apud

Körn. in Mart., Fl. Bras. 3 (1): 335. 1863. Paepalanthus polyanthus var. ♂ Körn. in Mart., Fl. Bras. 3 (1): 335—336. 1863. Paepalanthus polyanthus var. ♀ Körn. in Mart., Fl. Bras. 3 (1): 335—336. 1863. Actinocephalus polyanthus Kunth ex V. A. Pouls., Vidensk. Meddel. Kjøbenh. 1888: 278. 1888. Dupatya polyantha (Bong.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya polyantha Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus polyanthus var. Körn. ex Alv. Silv., Fl. Mont. 1: 411. 1928. Eriocaulon polyanthes Mart. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959. Paepalanthus polyanthus var. alfa Körn. ex Rennó, Levant. Herb. Inst. Agron. Minas 71. 1960. Paepalanthus polyanthus var. ♀ Körn. ex Moldenke, Fifth Summ. 2: 588, in syn. 1971. Paepalanthus polyanthus var. ♂ Körn. ex Moldenke, Fifth Summ. 2: 588, in syn. 1971. Paepalanthus polyanthos (Bong.) Kunth ex Moldenke, Phytologia 28: 460, in syn. 1974. Paepalanthus polyanthus Ktz. ex Moldenke, Phytologia 28: 461, in syn. 1974.

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 339 & 622, pl. 2. 1831; Bong., Ess. Monog. Erioc. 22 & 39—41, pl. 2. 1831; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 516, 572, 614, & 625. 1841; Mart., Flora 24, Beibl. 2: 35 & 36. 1841; G. Gardn. in Hook. f., Icon. Pl. 6 [ser. 2, 2]: vi & viii, pl. 512. 1843; D. Dietr., Syn. Pl. 5: 261. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 274, 334, & 342. 1855; Körn. in Mart., Fl. Bras. 3 (1): 324, 326, 335—336, & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; V. A. Pouls., Bot. Tidsskr. 18: 285 & 291, pl. 20 B. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 & 879 (1893) and pr. 1, 2: 402. 1894; Malme, Bih. Svensk. Vet. Akad. Handl. 27 (3), no. 11: 27. 1901; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4—30): 10, 190, 197—199, 284, 285, 287, & 291, fig. 27. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 294—295. 1908; Alv. Silv., Fl. Mont. 1: 200, 222, & 411. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 41, 42, & 52. 1930; Stapf, Ind. Lond. 3: 91 (1930) and 4: 519. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 & 879 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 15, 31, 35, 38, 52, & 54. 1946; Moldenke, Alph. List Cit. 1: 223 (1946), 3: 710 (1949), and 4: 1203, 1210, & 1288. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Rambo, Anais Bot. 2: 128. 1950; Moldenke, Phytologia 4: 202. 1953; Rambo, Sellowia 6: 130. 1954; Mendes Magalhães, Anais V Reun. Anual Soc. Bot. Bras. 293, 298, & 299, fig. 9 & 10. 1956; Reitz, Sellowia 7: 124. 1956; Angely, Fl. Paran. 10: 14. 1957; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 101, 227, 281, 288, 291, 327, 328, & 489. 1959; Moldenke, Résumé Suppl. 1: 6, 17, & 22. 1959; Reitz, Sellowia 11: 31 & 119. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 & 879 (1960) and pr. 3, 2: 402. 1960; Rennó, Levant. Herb. Inst. Agron. Minas 71. 1960; Angely, Fl. Paran. 16: 66

(1960) and 17: 24. 1961; Reitz, *Sellowia* 13: 72 & 90. 1961; Moldenke, *Résumé Suppl.* 3: 34. 1962; Angely, *Fl. Anal. Paran.*, ed. 1, 200. 1965; Tomlinson in C. R. Metcalfe, *Anat. Monocot.* 3: 159-161, 166, 167, 172, 189, & 190. 1969; Moldenke, *Fifth Summ.* 1: 165, 377, & 484 (1971) and 2: 501, 509, 513, 588, 590, & 956. 1971; Angely, *Fl. Anal. & Fitogeogr. Est. S. Paulo*, ed. 1, 6: 1160, map 1780, & Ind. 12 & 21. 1972; Moldenke, *Biol. Abstr.* 56: 3000. 1973; Moldenke, *Phytologia* 25: 155 & 229 (1973), 26: 202, 228, & 229 (1973), 28: 439, 460, & 461 (1974), 29: 307 (1974), and 30: 23. 1975.

Illustrations: Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 1: pl. 2. 1831; Bong., *Ess. Monog. Erioc.* pl. 2. 1831; G. Gardn. in Hook. f., *Icon. Pl.* 6 [ser. 2, 2]: pl. 512. 1843; V. A. Poulos., *Bot. Tidsskr.* 18: pl. 20 B. 1893; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 198, fig. 27. 1903; Mendes Magalhães, *Anais V Reun. Anual Soc. Bot. Bras.* 298 & 299, fig. 9 & 10. 1956.

This species was originally described by Bongard (1831) as "*caulibus caespitosis simplicibus; foliis radicalibus e basi perlata longe-lanceolatis obtusis; caulinis minoribus amplexicaulibus adpressis planis; pedunculis pilosis; vaginis bifidis glabris. t. 2. Hab. in pratis humidis glareosis Serra da Lapa. Floret Novembri.*" Obs. Differt ab *E. Maximiliani*: *caulibus caespitosis simplicibus; foliis radicalibus lato-lanceolatis (nec lineari-lanceolatis), caulinis adpressis planis (nec patentibus canaliculatis); pedunculis duplo brevioribus pilosis; vaginis bifidis.*" The type is apparently *L. Riedel 2065* from the Serra do Lapa, Minas Gerais, Brazil, deposited in the Leningrad herbarium. Kunth (1841) has provided a much more ample description. The *Eriocaulon polyanthum* Mart., referred to in the synonymy above, is a synonym of *Paepalanthus clausenianus* Körn.

Recent collectors have found *P. polyanthum* growing on stony hilltops in areas of sandy campo with outcrops, in wet places with quartz outcrops, on wet or dry campos, restinga, "restinga arenosa", mountain slopes and peaks, alpine or wet pebbly meadows, grassy campos, wet places in general, and in wet ground among rocks in an area of grassy meadows and adjacent sandy campos, at altitudes of 3 to 2000 meters, flowering from September to July and fruiting from January to March and in November. They describe the plant as an erect herb, 0.5-2 m. tall, the stems stout and branched, the inflorescences "borne in globular umbels"; sordid-white or white, the flower-heads themselves white or light-gray, and "flôr branca", "flôr creme", or "flôr côr de palha". The cauline leaves are usually more or less ascending-spreading — rather attenuate-acuminate to the apex, to 13 in. long and 2.5 cm. wide at the base, sometimes very widely divergent above the base. They are well depicted in Fig. 27 B of Ruhland's work (1903). The hairs on the peduncles are abundant, mostly erect or ascending at an acute angle with the peduncle, and rather short. They are very accurately portrayed in Fig. 27 C of Ruhland's illustration.

Irwin and his associates encountered this species on upper

shrub-covered slopes with iron-rich rocks and gravel, the soil restricted to crevices and pockets, in wet places on campos, in sandy places in an area of rocky summits and intervening gallery forest, and in cerrado on rocky slopes. Deslandes describes it as a "planta de terreno pura areia, seco, quasi esteril".

Rambo (1950) states that "Segundo Ruhland....teria sido encontrado 'em lugares húmidos no RGS' [Rio Grande do Sul, Brazil] por Sellow, levando o número 1.934. Como os números Sellowianos 1293-1503 são duma excursão ao Rio Pardo no centro do Rio Grande; e como esta espécie posteriormente jamais foi vista por outro botânico em tal região, tenho as minhas dúvidas a respeito desta indicação." Similarly, it should be noted here that the printed labels accompanying Glaziou 7992 are inscribed "Rio de Janeiro", but the collection was actually made in São Paulo.

Common names reported for the species are "capim manso", "capipoatinga", "gravatá manso", and "semprevivas do campo".

Körnigke describes his var.  $\alpha$ , the typical variety, as having "ramis glabriusculis" and as synonyms cites P. polyanthus Kunth, P. speciosus G. Gardn., Eriocaulon polyanthum Bong., and E. gardneri Steud., giving L. Riedel s.n. [Minas Gerais] and G. Gardner 5244 as representative collections ("in prov. Minarum pratis humidis glareosis Serra da Lapa, Decembri: Riedel; in declivibus montium petrosorum districtus adamantini, Julio: Gardner n. 5244"). Ruhland (1903) cites the same G. Gardner 5244 and a Riedel 2065.

Körnigke's var.  $\beta$  is described as having "ramis tomentosc-hirtis", represented by two unnumbered collections of Sellow and of Martius ["in prov. Minarum campis ferruginosis ad Pires, Capão et in Serra do Caraça: M.; Octobri: Sellow"]. The Martius collection is cited by Ruhland, but the only Sellow collection he cites is Sellow 1394 from Rio Grande do Sul.

Körnigke's P. speciosus var.  $\gamma$ , sometimes cited as a synonym of P. polyanthus, is characterized by him in notes accompanying a drawing in the Berlin herbarium as having "foliis in caulo elato inferioribus utrinque dense pubescentibus" and thus probably belongs in the synonymy of P. polyanthus var. tomentosus Alv. Silv.

Material of P. polyanthus has been widely confused with P. plumipes Alv. Silv., a very similar species apparently confined to the Serra do Cabral and Serra do Cipó (where, however, P. polyanthus seems also to occur), with the cauline leaves mostly shorter, blunter, strictly erect, rather closely appressed to the stems or branches, not acuminate-attenuate at the tip, and not at all widely divergent and with the hairs on the peduncles twice as long, very dense and conspicuous, and standing out at right angles to the peduncles. In addition to being closely related to P. plumipes, P. polyanthus is also related to and may be confused with P. bifrons Alv. Silv., P. brasiliensis (Mart.) Mart., P. ciliatus (Bong.) Kunth, and P. rigidus (Bong.) Kunth.

Material of P. polyanthus has been misidentified and distribu-

ted in some herbaria under the names Eriocaulon ciliatum Bong., E. ithyphyllum Mart., E. maximiliani Bong., Paepalanthus claussenianus Körn., P. ithyphyllum Mart., and P. plumipes Aiv. Silv. On the other hand, the P. Clausen s.n. [1840] and Martius 879, distributed (and in the case of the latter also previously cited by me) as P. polyanthus, are actually P. claussenianus Körn.; Irwin, Maxwell, & Wasshausen 20701 is P. coutoensis Moldenke; G. Gardner 5243, Hatschbach 23211, Herb. Rio Jan. 77002 & 126563, Herb. Saldanha 6587, F. C. Hoehne s.n. [3-11-28], Irwin, Fonsêca, Souza, Reis dos Santos, & Ramos 27952, Koyama, Hatschbach, Koyama, & Lima 13846, Merxmüller 25580, Rambo 49611, Reitz & Klein 17478, Sacco 2373, Santos 2167, Schwacke 2485, and Vidal III-64 [Vidal & Silva Araujo s.n.], III-65 [Vidal & Silva-Araujo s.n.; Herb. Rio Jan. 77001], & III-508 [Herb. Rio Jan. 76039] are P. polyanthus f. villosus (Beauverd) Moldenke & Smith; and P. Clausen 3 & s.n. and Martius s.n. are P. ramosus (Wikstr.) Kunth. It is quite possible that some of the specimens cited below may represent other taxa than typical P. polyanthus since in many cases they are represented in herbaria by only small fragmentary portions of the plant which may or may not exhibit the diagnostic characters separating closely related taxa. Intensive field work is required to settle these points.

Silveira (1928) cites A. Silveira 265 from Serra da Treituba, collected in 1897, while for what he calls "P. polyanthus var. Koern." he cites A. Silveira 538 from the Serra do Cipó, collected in 1909.

Ruhland (1903) cites the following: Minas Gerais: G. Gardner 5244, Glaziou 5712 & 6743, Martius s.n. [Serra do Caraça], Mendonça 322, Regnell III.1271, L. Riedel 2065, Ule 3768. Rio Grande do Sul: Sellow 1394. São Paulo: Lund s.n. [Araraguara], Schwacke 1903. Santa Catarina: Schwacke 2458. These are probably all deposited in the Berlin herbarium. He comments that the "Species generis maxima. Umbellis pulcherrimis, multiscapis, regularibus et pedunculorum indumento insignis."

Additional citations: BRAZIL: Bahia: Belém 3544 (Ac, N). Espírito Santo: Belém 3840 (Ld, N). Minas Gerais: Damazio 705 (B); G. Gardner 5244 (B, N); Glaziou 5712 (B); Héringer 4345 (N); Héringer & Castellanos 6156 (B); Irwin, Fonsêca, Souza, Reis dos Santos, & Ramos 27952 (Ac, N), 28345 (Ld, N); Irwin, Harley, & Onishi 30388 (Ld, N); Irwin, Maxwell, & Wasshausen 20046 (Ac, N), 20662 (Ac, N); Irwin, Reis dos Santos, Souza, & Fonsêca 22026 (Ac, N); Maguire, Maguire, & Murça Pires 44763 (N, N, N); Martius 990 (Mu); Mendes Magalhães 6019 (Z); Regnell III.1271 [30/3/1844] (Mu, S, S, S, W--936261), III.1271 [20/3/1974] (Er, S, S, W--200759); L. Riedel 2065 (B--isotype, Ut--374--isotype); Weddell 1867 [no. 47] (Br); Williams & Assis 5799 (Ca--744440), 6980 (W--

1932870); Zikán s.n. [Herb. Inst. Biol. S. Paulo 5389] (N). Paraná: Angely 1039 (N); Brade 19628 (Ja—65773); A. Castellanos s.n. [7-I-1957] (Ja—126562); Dombrowski 1249 [Herb. Inst. Def. Pat. Nat. 8951] (Ld), 2274 [Kuniyoshi 2017] (Ac), 2751 [Kuniyoshi 2093] (Ld); Dusén 7278 (Mu, S), 7359 (N, S, W—1280828), 9486 (S), 13442 (S), 15647 (S, S, S), s.n. [Martio 12 a. 1904] (S); Hatschbach 6030 (Mi), 23211 (Ac, N); Jónsson 1182a (S); Klein 4580 (Ld); Koyama & Koyama 13846 (N); Mattos 4390 (N, Rd—14857); Reitz & Klein 17478 (Ac, N); Smith, Klein, & Hatschbach 14441 (Ac). Rio de Janeiro: Brade & Tamandaré 6577 (Mu); Holway & Holway 1868 (W—1188357); Rose & Lutz 27 [Herb. Mus. Nac. Rio Jan. 52478] (Gg—366810); Segadas-Vianna 10 (Ja), 5034 [Brade 20372] (Ja). Rio Grande do Sul: Sehnm 5454 (B); Sellow 1394 [46] (B, B, B, B); J. Vidal IV-618 (W—2639607). Santa Catarina: Rambo 49611 (N, S); Ramiz Galvão s.n. [XII.1884; Herb. Saldanha 8806] (Ja—43990, Ja, Ja); Reitz 4687 (Le, S), 4900 (Ac, N), C.863 (Ja—55280, Ja, N); Reitz & Klein 14074 (Ld); Smith & Klein 10634 (W—2248758); Smith & Reitz 8630 (Ok), 10072 (Ok); J. Vidal IV-618 (Ca—1169392). São Paulo: Glaziou 7992 (B); Guimares 1707 (Sf); Löfgren 1127 (P, S); A. Lutz 308 (Ja); Lutz & Lutz 1608 [Herb. A. Lutz 1608] (Ja). Marinheiros Island: Deslandes s.n. (Sp—25260). Santa Catarina Island: Klein & Bresolin 6392 (Ac). State undetermined: P. Clausen s.n. (Br); J. E. Pohl s.n. [Brasilia] (Br); Scheidweiler s.n. (Br, N). MOUNTED ILLUSTRATIONS: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: pl. 2. 1831 (N, Z); drawings by Körnicke (B).

PAEPALANTHUS POLYANTHUS var. TOMENTOSUS Alv. Silv., Fl. Mont. 1: 222 & 411 [as "tomentosa"]. 1928.

Synonymy: Paepalanthus speciosus var.  $\beta$  Körn. in Mart., Fl. Bras. 3 (1): 315 & 316. 1863. Paepalanthus polyanthus var. tomentosa Alv. Silv., Fl. Mont. 1: 222 & 411. 1928.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 315 & 316. 1863; Alv. Silv., Fl. Mont. 1: 222 & 411. 1928; Moldenke, Known Geogr. Distrib. Erioc. 15 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Moldenke, Résumé 101 & 489. 1959; Moldenke, Résumé Suppl. 1: 22. 1959; Moldenke, Fifth Summ. 1: 165 (1971) and 2: 956. 1971; Moldenke, Phytologia 28: 461. 1974.

Körnicke's original (1863) description of this variety is "foliis in caulo elato inferioribus utrinque dense pubescentibus", based on a Sellow collection from "Brasilia meridionali" and two Martius collections from "in Minis Novis et in Serra de S. Antonio prov. Minarum", while Silveira's original (1928) is "foliis caulinis et illis ramorum utrinque tomentosus. In campis prope Diamantina, Minas Gerais: Alv. Silveira. Apr. 1908: n. 503 in herbario Silveira." While I have not actually seen any of the type or cotype material, I am tentatively assuming that they represent

the same taxon and not f. villosus (Beauverd) Moldenke & Smith.

As far as known to me at this time, the taxon is known only from these original collections.

PAEPALANTHUS POLYANTHUS f. VILLOSUS (Beauverd) Moldenke & Smith  
in Moldenke, Phytologia 25: 431. 1973.

Synonymy: Paepalanthus polyanthus var. villosus Beauverd, Bull. Herb. Boiss., ser. 2, 8: 294--295. 1908.

Bibliography: Beauverd, Bull. Herb. Boiss., ser. 2, 8: 294--295. 1908; Moldenke, Known Geogr. Distrib. Erioc. 15 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Moldenke, Phytologia 4: 202. 1953; Moldenke, Résumé 101 & 489. 1959; Moldenke, Résumé Suppl. 1: 6. 1959; Moldenke, Fifth summ. 1: 165 (1971) and 2: 956. 1971; Moldenke, Biol. Abstr. 56: 3000. 1973; Moldenke, Phytologia 25: 431. 1973.

This taxon is based on an unnumbered collection of E. Gounelle from "Sitio de Ramos altitude 2000 et 2300 m., Itatiaya", Minas Gerais, Brazil, collected in February, 1899, and deposited in the Herbarium Boissier at Geneva. Beauverd (1908) comments: "Comparée aux 2 échantillons typiques conservés à l'herbier Boissier (Gardner No. 5244, parois de rochers des montagnes du district de Diamantina; Riedel No. 2065, prairies marécageuses de la Serra de Lapa), cette plante s'en distingue à première vue par l'indument laineux recouvrant les deux pages des feuilles caulinaires et plus encore les hampes raméales florifères; examinées au microscope ces différences s'accroissent et se trouvent renforcées par la présence de petits poils à base tuberculeuse recouvrant les deux pages des feuilles ainsi que la face externe des écailles des capitules: chez les échantillons typiques les aiguillons microscopiques des feuilles caulinaires ne sont pas tuberculeux à la base mais, au contraire, sont décurrents sur le limbe foliaire; en outre le sommet des écailles des capitules est orné de poils terminés en tête de massue, tandis que ceux de notre nouvelle variété représentent des cils flexueux très acuminés au sommet. -- Ces différences d'intérêt anatomique important ne sauraient toutefois suffire pour distinguer spécifiquement la nouvelle forme récoltée par M. Gounelle: les caractères essentiels notamment ceux tirés des organes floraux, sont identiques à ceux de échantillons typiques que nous avons examinés. -- Notions toute fois dans la Monographie de Ruhland p. 199, l'indication du No. 3768 de Ule provenant également de l'Itatiaia à l'altitude de 2000 m., et qui pourrait fort bien appartenir à notre nouvelle variété!"

Recent collectors describe this plant as an herb, 0.5--0.75 m. tall, the heads white, and the flowers cream-colored. They have found it growing in sandy soil, on campos, and in wet depressions on campos, at altitudes of 900--2450 m., flowering from November to April. The Segadas-Vianna 2864 & 3125 collections, cited below, are immature. Irwin and his associates encountered the plant in "sandy places in area of rocky summits and intervening gallery forest"; Anderson and his associates found it "in cerrado, area of rocky sandstone cerrado and open rocky hillsides with white sandy

soil sloping down to grassy brejo, creek, and adjacent gallery forest"; and Rambo encountered it "in rupestribus graminosis humidis" and says of it "species vere magnifica, scapo 0,75 metrali, foliis iam siccis. Inflorescentiae ramı partiales hic apponuntur."

In many herbaria this taxon is united with typical *P. polyanthus* (Bong.) Kunth. On the other hand, the Moldenke & Moldenke 19600, previously cited by me as *P. polyanthus* var. villosus, is actually *P. ramosus* var. affinis (Bong.) Ruhl.

Additional citations: BRAZIL: Minas Gerais: Anderson, Stieber, & Kirkbride 35370 (N, Z); Irwin, Fonsēca, Souza, Reis dos Santos, & Ramos 27952 (N); Dusén 300 (S), 431 (S), s.n. [14/7/1902] (S); Merxmüller 25580 (Mu, Mu). Paraná: Hatschbach 23211 (N); F. C. Hoehne s.n. [3-11-28] (Sp-23359); Koyama, Hatschbach, Koyama, & Lima 13846 (N); Reitz & Klein 17478 (N); Santos 2167 [Sacco 2373] (Ja-126563); Schwacke 2485 [Herb. Saldanha 6587] (Ja-47866); Vidal III-508 [Herb. Rio Jan. 76039] (W-2639609); Vidal & Silva Araujo III-64 [Herb. Rio Jan. 77002] (Ld), III-65 [Herb. Rio Jan. 77001] (W-2639608). Rio de Janeiro: Brade 12757 [Herb. Rio Jan. 25389] (B); H. Santos 811 [750] (La), 5038 (Ja). Santa Catarina: Rambo 49611 (N). São Paulo: Segadas-Vianna 2864 [Lev. Fitosociol. 510430-0210] (Ja), 3125 (Ja). State undetermined: G. Gardner 5243 (N).

PAEPALANTHUS POLYCLADUS Alv. Silv., Fl. Mont. 1: 189-190, pl. 122-124. 1928.

Synonymy: *Paepalanthus polyclados* Alv. Silv. ex Moldenke, Résumé 327, in syn. 1959.

Bibliography: Alv. Silv., Fl. Mont. 1: 189-190 & 411. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 477. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 184. 1941; Moldenke, Known Geogr. Distrib. Eric. 15 & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Moldenke, Résumé 101, 327, & 489. 1959; Moldenke, Fifth Summ. 1: 165 (1971) and 2: 588 & 956. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 122-124. 1928.

Silveira (1928) says that the type of this species was collected "In arenosis in serra do Chapadao, Minas: Alvaro da Silveira, Apr, 1925: n. 742 in herbario Silveira", but on page 411 of his same work he cites the type locality as "Serra da Babylonia (Passos)". The species is known thus far only from the original collection.

PAEPALANTHUS POLYGONUS Körn. in Mart., Fl. Bras. 3 (1): 393-394. 1863.

Synonymy: *Dupatya polygona* (Körn.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. *Dupatya polygona* Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 280—282, 299, 393—394, & 507. 1863; Benth. & Hook. f., Gen. Pl. 3 (2): 1022 & 1023. 1883; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 22. 1888; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 4, 12, 167, 284, & 291. 1903; Alv. Silv., Fl. Mont. 1: 134. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40 & 51. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1944; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 15, 31, & 52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 87 & 211. 1949; Moldenke, Phytologia 4: 202. 1953; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 101, 281, & 489. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 158. 1969; Moldenke, Fifth Summ. 1: 165 & 484 (1971) and 2: 956. 1971; Moldenke, Phytologia 29: 487. 1974.

Recent collectors have found this species growing at 3800 feet altitude, flowering in December. Ruhland (1903) says of it "Speciem illius sectionis Actinocephali similem esse jam cl. Koernicke affirmavit".

Additional & emended citations: BRAZIL: Minas Gerais: G. Gardner 5245 [Macbride photos 10636] (B—type, N—isotype, N—photo of type, N—photo of type, W—photo of type); Maguire, Maguire, & Murça Pires 44746 (N, N), 44747 (N, N). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS POLYTRICHOIDES Kunth, Enum. Pl. 3: 504—505. 1841  
[not P. polytrichoides Ruhl., 1938].

Synonymy: Eriocaulon tenue Poepp. ex Kunth, Enum. Pl. 3: 505 & 614, in syn. 1841 [not E. tenue Buch.-Ham., 1832, nor Hamilt., 1959, nor Humb. & Bonpl., 1817, nor H.B.K., 1816, nor Humb. & Kunth, 1841, nor Kunth, 1826]. Eriocaulon polytrichoides (Kunth) D. Dietr., Syn. Pl. 5: 260. 1852. Eriocaulon polytrichoides Kunth ex Steud., Syn. Pl. Glum. 2: [Cyp.] 275 & 334. 1855. Paepalanthus polytrichoides var.  $\alpha$  Körn. in Mart., Fl. Bras. 3 (1): 359. 1863. Paepalanthus polytrichoides var.  $\beta$  Körn. in Mart., Fl. Bras. 3 (1): 359. 1863. Dupatya polytrichodes (Kunth) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Eriocaulon polytrichoides Steud. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 275, in syn. 1893. Paepalanthus macaranus Huber, Bol. Mus. Para. 2: 500—501. 1898. Dupatya polytrichodes Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Dupatya polytrichoides Kuntze apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 157, in syn. 1903.

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f. & Jacks., Ind. Kew., pr. 1, 1: 879 (1893) and pr. 1, 2: 402. 1894; Huber, Bol. Mus. Para. 2: 500—501. 1898; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 152, 157, 284, 287, & 291. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 131. 1904; Alv. Silv., Fl. Mont. 1: 111. 1928; J. F. Macbr., Field Mus. Publ. Bot. 13 (363): 490 & 493. 1936; Uittien & Heyn in Pulle, Fl. Surin. 1 [Meded. Konink. Ver. Ind. Inst. 30, Afd. Handelmus. 11]: 215, 216, & 219—220. 1938; Moldenke in Gleason & Killip, Brittonia 2: 158. 1939; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 15, 31, 38, 41, 50, 52, & 60. 1946; Moldenke, Phytologia 2: 373 (1947) and 3: 80. 1949; Moldenke, Alph. List Cit. 3: 744 & 895 (1949) and 4: 985. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 67, 73, 87, 95, & 211. 1949; Moldenke, Phytologia 4: 202. 1953; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 68, 72, 77, 84, 101, 112, 281, 291, 293, 326, & 489. 1959; Soukup, Biota 5: 302. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879 (1960) and pr. 3, 2: 402. 1960; Moldenke, Résumé Suppl. 3: 12 & 13 (1962) and 5: 5. 1962; Hocking, Excerpt. Bot. A.6: 455. 1963; Moldenke, Résumé Suppl. 12: 3. 1965; Schnell, Adansonia, ser. 2, 5: 343. 1965; Van Donselaar, Wentia 14: 70. 1965; Huinink, Wentia 17: 138-139. 1966; Lindeman & Görts-van Rijn in Pulle & Lanjouw, Fl. Surin. 1 [Meded. Konink. Inst. Trop. 30, Afd. Trop. Prod. 11]: 331 & 333. 1968; Moldenke, Résumé Suppl. 18: 9. 1969; Teunissen & Wildschut, Verh. Konink. Nederl. Akad. Wet. Natuurk. 59 (2): 23 & 57. 1970; Moldenke, Fifth Summ. 1: 118, 125, 132, 142, 166, 180, & 484 (1971) and 2: 509, 514, 586, & 956. 1971; Teunissen & Wildschut, Meded. Bot. Mus. Utr. 341: 23 & 57. 1971; Moldenke, Phytologia 25: 229 (1973), 28: 461 (1974), 29: 317, 318, & 323 (1974), and 30: 35 & 37. 1975.

The type of this species was collected by Eduard Friedrich Poeppig along the Rio Pará in the state of the same name, Brazil, and is deposited in the herbarium of the Botanisches Museum in Berlin.

The Eriocaulon tenue accredited to Hamilton, referred to in the synonymy above, is a synonym of E. cinereum R. Br., while that credited to Humboldt, Bonpland, & Kunth is the name-bringing synonym of Syngonanthus tenuis (H.B.K.) Ruhl.; the Paepalanthus polytrichoides credited to Ruhland is a synonym of P. subtilis Miq.

The last two mentioned species are indeed very closely related and similar in general appearance, but, according to Uittien & Heyn (1938), can be differentiated as follows:

Bracts yellowish, not pellucid, the outer ones ovate, acute or acuminate, the inner ones acute or subobtusely....P. polytrichoides  
 Bracts white, pellucid, the outer ones lanceolate, acuminate, the inner ones obovate-oblong, mucronate.....P. subtilis

[to be continued]